

## Vegetation and Flora of the Swan River Oxbow Preserve

PETER  
LESICA 1986

The preserve is located along the east side of the Swan River approximately two miles south of where it empties into Swan Lake. Most of the preserve is on the delta which has been formed by the river upon entering the lake. Although the river channel appears to be stable, flooding of the slough, the marshy areas surrounding it and much of the lower ground at the west end of the preserve occurs each spring during high water. Groundwater levels on the east end are high throughout the year. Many springs and seeps are present, and much of the area has standing water during the majority of the growing season. Two of the most important factors controlling the vegetation patterning on the preserve are the high groundwater table and periodic flooding by the river.

Forests on the west end of the preserve near the river are dominated by cottonwood. Spruce is a common component of these cottonwood forests, and spruce reproduction appears to be more common than cottonwood reproduction. Although cottonwood forest might be considered successional to spruce forest, the disturbance resulting from periodic flooding probably promotes the continued existence of the cottonwoods in these low areas. The high water table at the east end of the preserve is evidenced by the presence of numerous springs and seeps. The slightly higher areas around these springs and seeps is dominated by spruce forest. Just north of the spruce forest the action of beavers along Spring Creek has resulted in wetter, usually innundated terrain underlain by organic soils and occupied by fen-carr vegetation. Shrubby carr vegetation usually occurs adjacent to the spruce forest in areas of slightly better aerated soils than the fen. Small spruce trees are common in the carr vegetation, but rooting is shallow, and the wet soils provide poor support, so few trees reach heights greater than the shrubs before they become uprooted. Fen and carr vegetation interfinger in a complicated small-scale fashion, thus these two vegetation types are mapped as one unit. As one moves west away from Spring Creek, the vegetation is less affected by groundwater and more affected by spring flooding of the river. Low areas at the west end of the preserve are flooded early in the year but dry out later in the summer. The yearly drying of these areas prevents the formation of organic soils and results in the presence of marsh vegetation instead of fen-carr.

The following descriptions of the vegetation and flora of the Swan River Oxbow Preserve are the result of approximately 30 hours of reconnaissance carried out on May 21, June 3-4, July 21-22, and July 25, 1986. The species inventory and descriptions of the vegetation apply to only that part of the Edge property north of the Porcupine Creek Road. The study area is large and diverse. Not all of the study area was surveyed during each visit, thus the species inventory cannot be considered exhaustive.

REPORT TO THE NATURE CONSERVANCY

### Cottonwood Forest

Mature cottonwood forest is the predominant vegetation in the western half of the preserve. Soils are sandy to loamy and moist throughout much of the growing season. Spring flooding occurs in some areas. The dominant canopy tree is black cottonwood (Populus trichocarpa). Spruce (Picea engelmannii) and paper birch (Betula papyifera) are also common, but together they compose less than 50% of the canopy. Common shrubs in the understory include alder buckthorn (Rhamnus alnifolia), thinleaf alder (Alnus incana), snowberry (Symphoricarpos albus), Oregon grape (Berberis repens) and dogwood (Cornus stolonifera). Shrub cover is very dense beneath open cottonwood canopies and quite light in areas dominated by spruce. Common herbaceous understory species are wild sarsaparilla (Aralia nudicaulis), dwarf bramble (Rubus pubescens), lady fern (Athyrium filix-femina) and Canada violet (Viola canadensis). Herbaceous cover is generally high throughout this forest type.

### Spruce Forest

Wet spruce forests are found at the west end of the preserve. Soils are loamy and moist to wet with a high organic matter content. In wetter areas the forest floor displays a microtopography consisting of raised areas around the bases of trees and depressions, often filled with water into early summer, between the raised areas. The dominant tree is spruce. Small numbers of paper birch, Douglas fir (Pseudotsuga menziesii), lodgepole pine (Pinus contorta) and white pine (P. monticola) can be found. I observed many small seedlings of red cedar (Thuja plicata) but saw no mature trees. Alder buckthorn and Oregon grape are common understory shrubs. The herbaceous ground layer is dense and diverse. Common species include lady fern, wild sarsaparilla, dwarf bramble and oak fern (Gymnocarpium dryopteris).

This community type and the preceeding one correspond to the Picea/Equisetum arvense habitat type of Pfister et al. (1977, Forest habitat types of Montana). They state that this type is rare in Montana as a whole but is locally common in the Flathead Valley. These communities generally occur on broad alluvial valley bottoms, areas which are subject to disturbance or destruction from timber harvest activities, livestock grazing, recreational and residential development, and hydroelectric development. Large undisturbed tracts of these communities are rare in northwestern Montana and should probably be considered threatened.



## Birch Carr

Areas along the east margin of the cottonwood forest and along the north margin of the spruce forest display mire vegetation dominated by shrubs. Soils are organic and innundated or wet throughout the growing season. Carr vegetation is dominated by bog birch (Betula glandulosa). Bebb willow (Salix bebbiana), tea-leaved willow (Salix planifolia), dogwood, thinleaf alder and alder buckthorn are other common shrubs. Small spruce trees are scattered throughout the carr but apparently are not able to reach normal stature. Common herbaceous species include skunk cabbage (Lysichitum americanum), horsetail (Equisetum arvense), arrowleaf groundsel (Senecio triangularis), coltsfoot (Petasites sagittatus) and beaked sedge, (Carex rostrata).

## Sedge Fen

Mire vegetation dominated by sedges is found associated with the carr vegetation, and many species are common to both types. Soils are organic and flooded throughout all or most of the growing season. Fen vegetation is dominated by beaked sedge, lesser panicled sedge (Carex diandra), inland sedge (C. interior) and slender sedge (C. lasiocarpa). Common forbs include water horsetail (Equisetum fluviatile), marsh cinquefoil (Potentilla palustris), water-parsnip (Sium suave) and coltsfoot. Mountain willow (Salix monticola) and hoary willow (S. candida) are also present but not abundant.

## Marsh

Much of the northwest end of the preserve which includes old shallow sloughs of the Swan River is occupied by coarse sedges and grasses. Soils are silty and flooded throughout most of the growing season; however, drying and decomposition of organic matter does occur in most marsh areas in late summer and fall. Vegetation is dominated by canarygrass (Phalaris arundinacea), awned sedge (C. atherodes), inflated sedge (C. vesicaria) and beaked sedge. Common forbs include small-flowered forget-me-not, (Myosotis laxa), grass-leaved pondweed (Potamogeton gramineus), water horsetail and water-parsnip. Cattail (Typha latifolia) is common in some areas. The question of whether canarygrass is an exotic is open to debate, but it appears to be rather aggressive in the study area and may be replacing other components of the marsh community.

## Aquatic

Open water lacustrine habitat is found in the large oxbow slough at the west end of the preserve and in the beaver ponds along Spring Creek. Common species include yellow water-lily (Nuphar variegatum), water-milfoil, (Myriophyllum spicatum), mare's-tail (Hippuris vulgaris) and pondweeds (Potamogeton richardsonii, P. gramineus and P. natans). The aquatic community merges into the marsh community as the water becomes shallower.

## Calcareous Spring Meadow

This distinctive community occupies only a small area around the springs at the head of Spring Creek at the extreme east end of the preserve. Soils are gravelly and wet throughout the growing season with little fluctuation in water table. Vegetation in this community is sparse and dominated by yellow sedge (Carex flava) and green sedge (C. oederi). Characteristic forbs include Kalm's lobelia (Lobelia kalmii) and few-flowered spike-rush, (Eleocharis pauciflora). The grass, redtop (Agrostis alba) is also common.

This community type is generally found along calcareous shores and in calcareous fens. Similar communities are known from Dudley Slough, Lincoln Co., Elk Meadows, Missoula Co., and Pine Butte Fen, Teton Co. This community type is probably rare in Montana.

## Rare Plants

Howellia aquatilis Gray. Howellia. G2-S1. Howellia is an annual aquatic plant found in sylvan ponds which dry up before the end of the growing season. Historically, howellia is known from one station in northern California, two stations in Oregon, three stations in Washington, one station in northern Idaho and three stations in the Swan Valley of northwestern Montana. It is currently known to be extant only in Washington and Montana. Howellia is listed as extinct in California and endangered in Oregon, Washington and Montana. In the Swan River Oxbow Preserve, howellia occurs in at least three marshy areas adjacent to the large oxbow slough at the western end. In 1985 the population was estimated to be 5,000-10,000 plants. In 1986 the number of plants observed was much smaller, perhaps fewer than 100 plants. Large fluctuations in the population size of annual plants are not uncommon, and since at least 10-20 acres of potential habitat exist on the preserve, it is believed that the population is a long-term viable one (see Appendix A).

Potamogeton obtusifolius Mertens & Koch. Blunt-leaved pondweed. G4-S2. This species of pondweed is found in ponds and streams in the northeastern U.S. and adjacent Canada. It is apparently disjunct in northwestern Montana where it is currently known from at least five stations in Flathead, Glacier and Lake counties. On the Swan Oxbow Preserve, P. obtusifolius has been found in the west end of the oxbow slough. A population estimate cannot be made without putting a boat on the slough.

Comandra livida Richards. (= Geocaulon lividum (Richards.) Fern.). Northern bastard toadflax. G4-S2. This species is found from Alaska south to northeastern Washington, northern Idaho and northwestern Montana. In Montana it is known from approximately five stations in Lake, Flathead and Lincoln counties. It was listed as recommended for threatened status by the Montana Rare Plant Project, but it appears to be more common in the state than was once believed. On the Swan Oxbow Preserve C. livida has been found in the spruce forests at the east end, especially around the springs. Comandra is rhizomatous, making population estimates difficult. At least fifty stems in three separate areas have been observed, and thorough searching would undoubtedly result in the discovery of more.

Dryopteris cristata (L.) Gray. Buckler-fern. G4-S2. This species is circumboreal in distribution, occurring south in the Rocky Mountains to northern Idaho and northwestern Montana. Buckler-fern is listed as state threatened in Idaho, sensitive in Washington and rare in Montana. It is also listed as threatened or rare throughout much of its range in eastern North America (Steele et al., 1981, Vascular plants of concern in Idaho). In Montana this species is currently known from approximately five stations in Lake, Flathead and Missoula counties. On the Swan Oxbow Preserve, D. cristata was observed growing under shrubs in the carr and moist spruce forest in the center of the preserve. From 10-40 acres of potential habitat exists on the preserve. The entire area was not surveyed; however, it is likely that there is a population of at least fifty plants.

Viola septentrionalis Greene. Northern violet. G4-S1. This species is found in eastern North America and in British Columbia. A violet that seems to fit the description of V. septentrionalis was discovered in the cottonwood-spruce forest at the northwest end of the Swan Oxbow Preserve in 1986. A similar plant has been collected by Klaus Lackschewitz near Condon at the south end of the Swan Valley. A positive identification of this plant will have to await determination by an expert familiar with the genus. This violet appeared to be common in the area at the northwest corner of the preserve which was surveyed in early spring when the plant is easily identifiable.

Cypripedium calceolus L. var. parviflorum (Salisb.) Fern.  
(= C. parviflorum salisb.). Yellow lady's-slipper. G3T2-S2.  
Cypripedium calceolus (sensu lato) is found throughout  
northeastern U.S. and adjacent Canada, from British Columbia  
south to Utah and Colorado, and in Europe. The variety  
parviflorum is found in the western part of the species' range in  
North America. Yellow lady's-slipper is listed as endangered in  
Oregon and Idaho and threatened in Washington. It is known from  
at least ten locations in western Montana. A small population of  
approximately 50 plants occurs on Forest Service land just  
east of the big spring in an area ecotonal between fen and spruce  
forest.

### Exotics

Many species of Eurasian exotics have become established  
along the roads and in cutover areas bordering the preserve, but  
few have become established in the relatively undisturbed  
vegetation of the preserve itself. A few species of Eurasian  
meadow grasses and forbs are present in the area around the ruins  
of the old cabin just north of the main Forest Service road near  
the west end of the preserve. These weeds will most likely  
disappear as the forest reestablishes itself in the cleared area.  
Only two species of exotics appear to pose a potentially serious  
threat to the pristine nature of the preserve:

Canarygrass (Phalaris arundinacea) is considered by some to be an  
exotic; however, Hitchcock (1951, Manual of the grasses of the  
United States) does not consider it to be introduced, and  
Hitchcock et al. (1969, Vascular plants of the Pacific Northwest,  
Part 1) are uncertain of its origin. Regardless of its origin,  
this plant has come to dominate large areas of the wet meadows  
and marshy areas both north of the preserve and on the preserve  
itself. Its behavior should be monitored as it is capable of  
forming almost monospecific stands and may be capable of altering  
the marshy areas around the slough and making them uninhabitable  
for Howellia aquatilis.

Canada thistle (Cirsium arvense) has become established on the  
natural levee along the east bank of the Swan River and in parts  
of the fen around the main spring at the head of Spring Creek.  
This species spreads by rhizomes and is very aggressive. It  
probably is incapable of becoming established in either forested  
areas or wetlands, but it has the potential for increasing in  
ecotonal areas.

Peter Lesica

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## Vascular Plant Species Observed at the Swan Oxbow Preserve

### Aceraceae

*Acer glabrum*

### Alismataceae

*Alisma plantago-aquatica*

*Sagittaria cuneata*

### Apiaceae

*Angelica arguta*

*Cicuta douglasii*

*Heracleum lanatum*

*Osmorhiza chilensis*

*Sanicula marilandica*

*Sium suave*

### Araceae

*Lysichitum americanum*

### Araliaceae

*Aralia nudicaulis*

### Asteraceae

*Achillea millefolium*

*Anaphalis margaritacea*

*Arnica chamissonis*

*Artemisia ludoviciana*

*Aster junciformis*

*Aster laevis*

*Aster occidentalis*

*Centaurea maculosa*\*

*Chrysanthemum leucanthemum*\*

*Cirsium arvense*\*

*Cirsium vulgare*\*

*Filago arvensis*\*

*Petasites sagittatus*

*Senecio pseud aureus*

*Senecio triangularis*

*Solidago canadensis*

*Taraxacum officinale*\*

### Berberidaceae

*Berberis repens*

### Betulaceae

*Alnus incana*

*Betula glandulosa*

*Betula papyifera*

### Boraginaceae

*Cynoglossum officinale*\*

*Myosotis laxa*

### Brassicaceae

*Barbarea orthoceras*

*Cardamine pensylvanica*

### Callitrichaceae

*Callitriche heterophylla*

### Campanulaceae

*Howellia aquatilis*

*Lobelia kalmii*

### Caprifoliaceae

*Linnaea borealis*

*Symphoricarpos albus*

### Caryophyllaceae

*Stellaria longifolia*

### Cornaceae

*Cornus canadensis*

*Cornus stolonifera*

### Cupressaceae

*Juniperus communis*

*Juniperus occidentalis*

*Thuja plicata*

### Cyperaceae

*Carex aperta*

*Carex atherodes*

*Carex aurea*

*Carex bebbii*

*Carex buxbaumii*

*Carex capillaris*

*Carex dioica*

*Carex disperma*

*Carex douglasii*

*Carex flava*

*Carex geyeri*

*Carex interior*

*Carex lanuginosa*

*Carex lasiocarpa*

*Carex lenticularis*

*Carex leptalea*



Cyperaceae (cont.)

Carex microptera  
Carex muricata  
Carex retrosa  
Carex rossii  
Carex rostrata  
Carex stipata  
Carex vesicaria  
Carex vulpinoidea  
Eleocharis acicularis  
Eleocharis palustris  
Eleocharis pauciflora  
Eriophorum polystachion  
Scirpus microcarpus

Elaeagnaceae  
Shepherdia canadensis

Equisetaceae

Equisetum arvense  
Equisetum fluviatile  
Equisetum scirpoidea

Ericaceae

Chimaphila umbellata  
Menziesia ferruginea  
Pyrola asarifolia  
Pyrola minor  
Pyrola secunda  
Pyrola uniflora  
Vaccinium caespitosum  
Vaccinium membranaceum

Fabaceae

Lathyrus ochroleucus  
Trifolium agrarium\*  
Vicia americana

Grossulariaceae

Ribes lacustre  
Ribes setosum

Haloragaceae  
Myriophyllum spicatum

Hippuridaceae  
Hippuris vulgaris

Hypericaceae  
Hypericum formosum  
Hypericum perforatum\*

Iridaceae

Sisyrinchium angustifolium

Juncaceae

Juncus alpinus  
Juncus bufonius  
Juncus ensifolius  
Juncus longistylis  
Juncus nodosus  
Juncus tenuis

Lamiaceae

Lycopus uniflorus  
Mentha arvensis  
Physostegia parviflora  
Prunella vulgaris  
Scutellaria galericulata

Lemnaceae

Lemna minor

Lentibulariaceae

Utricularia vulgaris

Liliaceae

Clintonia uniflora  
Disporum trachycarpum  
Smilacina stellata  
Streptopus amplexifolius  
Trillium ovatum  
Veratrum viride  
Zygadenus elegans

Lycopodiaceae

Lycopodium annotinum

Menyanthaceae

Menyanthes trifoliata

Nymphaeaceae

Nuphar variegatum

Onagraceae

Circaea alpina  
Epilobium angustifolium  
Epilobium glaberrimum  
Epilobium palustre  
Epilobium watsonii



Ophioglossaceae

Botrychium multifidum  
Botrychium virginianum

Orchidaceae

Corallorhiza maculata  
Cypripedium calceolus  
Goodyera oblongifolia  
Habenaria dilatata  
Habenaria hyperborea  
Listera caurina  
Listera convallarioides

Pinaceae

Larix occidentalis  
Picea engelmannii  
Pinus contorta  
Pinus monticola  
Psedotsuga menziesii

Plantaginaceae

Plantago major\*

Poaceae

Agropyron repens\*  
Agrostis alba  
Agrostis exarata  
Alopecurus aequalis  
Alopecurus pratensis  
Beckmania syzigachne  
Bromus ciliata  
Calamagrostis canadensis  
Calamagrostis inexpansa  
Deschampsia cespitosa  
Elymus glaucus  
Glyceria borealis  
Glyceria striata  
Glyceria grandis  
Phalaris arundinacea  
Poa pratensis\*  
Trisetum cernuum

Polemoniaceae

Polemonium occidentale

Polygonaceae

Rumex crispus

Polypodiaceae

Athyrium filix-femina  
Cystopteris fragilis  
Dryopteris cristata  
Dryopteris filix-mas  
Gymnocarpium dryopteris  
Pteridium aquilinum

Potamogetonaceae

Potamogeton gramineus  
Potamogeton natans  
Potamogeton obtusifolius  
Potamogeton pectinatus  
Potamogeton richardsonii

Primulaceae

Dodecatheon pulchellum  
Lysimachia thrysiflora

Ranunculaceae

Actaea rubra  
Clematis columbiana  
Ranunculus aquatilis  
Ranunculus flamula  
Ranunculus gmelinii  
Ranunculus macounii  
Ranunculus uncinatus  
Thalictrum occidentale

Rhamnaceae

Rhamnus alnifolia  
Rhamnus purshiana

Rosaceae

Amelanchier alnifolia  
Crataegus douglasii  
Fragaria virginiana  
Geum macrophyllum  
Geum rivale  
Potentilla palustris  
Prunus virginiana  
Rosa nutkana  
Rosa woodsii  
Rubus idaeus  
Rubus parviflorus  
Rubus pubescens  
Spiraea betulifolia

Rubiaceae

Galium triflorum  
Galium trifidum

Salicaceae

Populus trichocarpa  
Salix bebbiana  
Salix candida  
Salix exigua  
Salix geyeriana  
Salix monticola  
Salix myrtifolia  
Salix phylllicifolia  
Salix rigida  
Salix sitchensis

Santalaceae

Comandra livida

Saxifragaceae

Mitella nuda  
Tiarella trifoliata

Scrophulariaceae

Melampyrum lineare  
Mimulus guttatus  
Mimulus moschatus  
Veronica americana  
Veronica catenata

Solanaceae

Solanum dulcamara\*

Sparganiaceae

Sparganium emersum  
Sparganium minimum

Typhaceae

Typha latifolia

Valerianaceae

Valeriana occidentalis

Violaceae

Viola adunca  
Viola canadensis  
Viola glabella  
Viola nephrophylla  
Viola septentrionalis (?)

Plant communities at  
Swan River Oxbow Preserve

- CF Cottonwood Forest  
S Spruce Forest  
M Marsh  
A Aquatic  
C Carr  
FC Fen-carr (complex  
of fen and carr  
communities)

